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USSR
ELECTRONIC AND PRECISION EQUIPMENT

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USSR ELECTRONIC AND PRECISION EQUIPMENT

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I. ITEMS OF SPECIAL INTEREST

A. Belorussian SSR Radio Production

The following number of radio receivers and television sets were produced in the Belorussian SSR from 1940 to 1956:

1940	1945	1950	1951	1952	1953	1954	1955	1956
400	--	46,300	17,500	20,000	31,400	49,000	83,700	124,400

(Narodnoye Khozyaystvo Belorusskoy SSR (The National Economy of the Belorussian SSR), Moscow, 1957, pp 24-25)

[Comment: The sharp drop in radio production noted in 1951 was probably due to the conversion of the Minsk Radio Plant imeni Molotov to some other kind of production, and to the establishment of the production of civilian radios at the new Minsk Radio Plant of the Ministry of Local Industry Belorussian SSR.]

Products of a Belorussian radio plant are on exhibit in the "Radioelektronika" Pavilion of the Exposition of the Achievements of the USSR National Economy in Moscow: the Belarus'-5 and Belarus'-6 combination sets, the Minsk miniature transistor radio, a stationary radio station, and a portable radion station. (Minsk, Sovetskaya Belorussiya, 17 Jun 59)

[Comment: This is the first known mention in the press of a Minsk transistor radio or of any radio stations made in Belorussia.]

B. USSR Power Capacitor Production

The production capacity of two USSR power capacitor plants alone [Serpukhov Kondensator Plant and Ust'-Kamenogorsk Capacitor Plant] exceeds the production capacity [of all capacitor manufacturing facilities] of the German Federal Republic, France, England, Sweden, Switzerland, and Italy combined. (Moscow, Vestnik Elektropromyshlennost', Jun 59, p 4)

C. Solar Heaters

The Central Workshops of the Ministry of Municipal Services Tadzhik SSR are producing solar heaters. Such heaters are being used at two baths in Stalinabad, and have made possible a substantial saving in fuel.

Soon, production will begin of small solar heaters for use in private shower rooms, kitchens, rest homes, and Pioneer camps. (Moscow, Izvestiya, 3 Jun 59)

D. Thermoelectric Generators

The [Pushkino] Termoelektrogenerator Plant [also known as the Pushkino Metallolampa Plant, the Moscow Metallolampa Plant, and the Moscow Radio Products Plant] produces thermoelectric generators, which convert the heat from ordinary kerosene lamps into electricity. These generators are used in the Tyan'-Shan' mountains, in taiga villages of Siberia and the Far East, and in remote areas of the steppes. More than 25 countries of Asia, Africa, South America, and Europe receive the products of the Termoelektrogenerator Plant.

The plant has begun the production of new semiconductor units with higher efficiencies than earlier types. It has worked jointly with scientific research institutes to develop and produce its first consignment of the three latest types of generators, including a table generator using a ten-line kerosene lamp instead of a 20-line lamp.

The plant has begun the assembly of an experimental consignment of semiconductor devices for converting the heat of stoves into electricity. Such generators are capable of producing a current with a power of 25 watts, which is sufficient both for lighting and tent of a reindeer herder and for supplying a radio receiver. (Moscow, Leninskoye Znamya, 3 Jun 59)

E. Shortage of Radio Components

According to A. Yershov, a radio fan in the city of Leningrad, it is very difficult to procure radio components in Leningrad stores, although the city's radio industry produces highly complex equipment and a great variety of components and parts.

Yershov wanted to build a television set based on a standard circuit and went to several stores to find parts, but to no avail. A radio components store on Liteynyy prospekt had no power transformers. Of 60 parts that he needed, he was able to purchase only one. Trips to other stores proved as fruitless. In many cases, the wealth of components displayed turned out to be obsolete.

Yershov wants nonstandard radio components to be put on sale. He says: "It is intolerable that radios and television sets have to be scrapped only because of some small defect. A radio fan could repair any television, instrument, or component. A low-price radio products store should be organized." (Leningradskaya Pravda, 3 Jul 59)

II. PLANTS

A. Rarely Mentioned Plants

In 1957, when the Leningrad Illumination Engineering Products Plant [Leningradskiy zavod svetotekhnicheskikh izdeliy] converted to the shopless method of management and at the same time reorganized its managerial structure, it cut down its shop and section engineering force by 55 percent and the engineers of its managerial staff by 13 percent, a total reduction of 38 percent throughout the plant. (Moscow, Vestnik Akademiy Nauk SSSR, May 59, p 53)

[Comment: This plant appears to be the one formerly mentioned as the Moscow Illumination Engineering Products Plant. The location cannot be definitely fixed.]

Writers often visit the Moscow Electrical Machine Building Plant "Pamyati revolyutsii 1905 Goda" [in memory of the 1905 Revolution], where they hold readings and discussions. (Moscow, Vechernyaya Moskva, 5 Jun 59)

[Comment: This may be the Moscow Electrical Machine Building Plant in Stalinskiy Rayon. This is the first time the name, "Pamyati revolyutsii 1905 goda," has been observed in the press.]

The electronic apparatus shop of the Khimki Yunyy Tekhnik Plant (Khimkinskiy zavod "Yunyy Tekhnik") is supplying, on an extracontractual basis, four- and six-channel amplifiers for recording dynamic tension gauge deformations on loop oscillographs.

The amplifiers are equipped with stabilized power packs and wire tension gauges.

The shop is accepting orders for the series production of electronic apparatus, using the materials of the [ordering ?] plant.

The plant is located at Ulitsa Glinki 10, Khimki, Moskovskaya Oblast. Its telephone number is D 6-73-93. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 12 Jun 59)

[Comment: This is the first time that mention of this plant has been observed in the Soviet press.]

The Baku Instrument Making Plant is subordinate to the Azerbaydzhan Sovnarkhoz. (Baku, Bakinskiy Rabochiy, 31 May 59)

[Comment: Only one previous mention of this plant has been noted in Soviet publications.]

B. New Plants In Operation

The Angarsk Electrical Machinery Plant (Angarskiy elektromekhanicheskiy zavod) [presumably a new plant] produces various automatic devices, including magnetic control stations (1). (Baku, Bakinskiy Rabochiy, 26 Jun 59)

(1) Photo showing the assembly of magnetic control stations, available in source, p 1, bottom, right

The Balaya Tserkov' Elektrokondensator Plant (Belotserkovskiy zavod "Elektrokondensator") [presumably a new plant] of the Kiyevskiy Sovnarkhoz produces types TGK-1 (anode and circuit), TGK-2.5, and PTK-2 high-voltage high-frequency ceramic capacitors, which are used in the circuits of high-voltage generators. The capacitors may also be supplied in shielded versions.

The plant is located at Mlinovaya ulitsa 33, Balaya Tserkov', Kiyevskaya Oblast. -- Advertisement (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 12 Jun 59)

The Baku Electrical Machinery Plant [presumably a new plant] of the "Azmorneftestroy" Trust [Elektromekhanicheskiy zavod tresta "Azmorneftestroy"] is located at Kaspiyskaya Ulitsa 19, Baku, 26. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 30 Jun 59)

The Baku Geophysical Instrument Plant [presumably a new plant] of the Geofizika Trust has produced a modernized electronic instrument for side testing an oil well during drilling. This instrument was designed by plant engineers and can be used for all types of electrical measuring work. It is one half the size and one quarter the weight of previously made instruments. (Ashkhabad, Turkmenskaya, Iskra, 28 May 59)

The Gori Instrument Making Plant (Goriyskiy priborostroitel'nyy zavod) is one of the newest enterprises in the city. It produces equipment for mechanization and automation of production processes. It is to begin mass production of a fat-content gauge developed by the Gori Scientific Research Institute for the Automation of Production Processes in Industry. By the end of 1959, this new plant, known as the "Gorpribor" Plant, is expected to produce 6 million rubles' worth of products. (Tbilisi, Zarya Vostoka, 4 Jul 59)

The new Zhitomir Elektroizmeritel' Plant has begun the production of precision equipment. (Kiev, Rabochaya Gazeta, 30 May 59)

The Tbilisi Agat Industrial Jewel Plant was organized only recently. It is now processing agate from the rich deposits in Akhaltsikhskiy Rayon. It has produced it first products: tapered agate bearings for instruments. These bearings are less than one millimeter in size; consequently, work must be done with high precision.

The Uglich Timepiece Plant helped to train workers for the Agat Plant. (Tbilisi, Zarya Vostoka, 22 May 59)

C. New Construction

The "Irkutskaluminstroy" Trust, which is erecting an aluminum plant in the settlement of Shelekhov, has also begun to construct another large industrial enterprise, a plant for the production of insulators for high-voltage transmission lines.

No other plant has the capacity the new plant will have. It will begin the production of hardened glass insulators, which will be stronger and lighter than those made of porcelain.

Two automatic constant-flow lines are planned for the glass insulator shop. Equipment for the first line will come from the Orlovskiy Sovnarkhoz. This line will produce 1.8 million insulators per year and will need only five operators. (Moscow, Sovetskaya Rossiya, 30 May 59)

A very large plant for the production of high-voltage line insulators of the Ministry of Construction of Electric Power Stations USSR is going up in the workers settlement of Shelekhov, near the Irkutsk Aluminum Plant, which is also under construction.

At full capacity, the Irkutsk Insulator Plant will be producing as many insulators per year as are now being produced in the entire USSR. (Riga, Sovetskaya Latviya, 29 May 59)

The Novaya Kakhovka Elektromash Plant (zavod "Elektromash") is one of the newest enterprises in the Ukrainian SSR. A number of its shops are already in operation, others are under construction, and others are still being planned. The plant's products are already known in China, Bulgaria, and India. Soon it will send three electric motors with auxiliary equipment to the exhibition in New York. (Kiev, Rabochaya Gazeta, 24 Jun 59)

Recently, a savings bank was organized at the Novaya Kakhovka Electrical Machine Building Plant (Nove-Kakhovskiy elektromashino-stroitel'nyy zavod). (Kiev, Pravda Ukrainy, 21 Jun 59)

The new electrical machine building plant in Novaya Kakhovka is being constructed at an extremely slow pace. Construction of this plant, which has a planned capacity of hundreds of thousands of electric motors per year, began in 1955; since then, only 31 percent of its estimated cost has been spent and only several tens of thousands of electric motors per year can be produced in the pertion of the plant that has gone into operation. (Moscow, Pravda, 20 Jul 59)

An electrothermic equipment plant is under construction near an inlet of the Azov Sea in Taganrog. Work at the plant is in an uproar because of the unsteady delivery of supplies and because of the actions of Petr Nikiforovich Abykin, plant director, who manages to create chaos out of everything. (Moscow, Izvestiya, 13 Jun 59)

III. LOCAL PRODUCTION AND ADMINISTRATION

A. RSFSR

From 1940 to 1958, RSFSR production of the articles indicated was as follows:

	Electric Motors (over 100 kw in power)	Timepieces of All Types
1940	3,000	2,800,000
1950	12,900	7,400,000
1953	10,200	12,400,000
1956	9,200	21,200,000
1957	10,500	21,800,000
1958	12,200	22,800,000

(Moscow, Vestnik Statistiki, Jun 59, p 82)

B. Baltic Republics

The following numbers of electric motors under 100 kw in power were produced in the Estonian SSR from 1950 to 1958: 1950, 75,700; 1953, 98,100; 1956, 166,300; 1957, 175,700; and 1958, 186,300. (Moscow, Vestnik Statistiki, Jun 59, p 96)

The production of electric bulbs in the Latvian SSR from 1950 to 1958 was as follows: 1950, 900,000; 1953, 12. million; 1956, 38. million; 1957, 46. million; and 1958, 56. million. (Moscow, Vestnik Statistiki, Jun 59, p 91)

The production of electric meters in the Lithuanian SSR from 1950 to 1958 was as follows: 1950, 20,000; 1953, 383,000; 1956, 947,000; 1957, 1,320,000; and 1958, 1,774,000. (Moscow, Vestnik Statistiki, Jun 59, p 89)

C. Ukrainian SSR

Not long ago, many industrial processes were checked by sight, sound, smell, or touch. Now, however, the bases of modern production are the instruments which maintain the correct temperature, pressure, and current and signal when the preset schedule is deviated from.

A modern instrument-making and automation equipment industry has been established in the USSR. A large proportion of these instruments are manufactured in the Ukrainian SSR.

Kiev is a large instrument-making center. Products of the Tochelektropribor Plant, the Relay and Automatics Plant, the Elektropriborov Plant (zavod "Elektropriborov"), the Kievpribor Plant (zavod "Kievpribor"), the Automatic Apportioning Machine Plant imeni Dzerzhinskiy (zavod portsionnyakh avtomatov imeni Dzerzhinskogo), and other plants are used in many branches of industry and the national economy.

The Khar'kov KIP [Control and Measuring Instrument] Plant and the Khar'kov Teploavtomat Plant supply complex equipment for the automation of production processes in the metallurgical industry. Recently, they developed a system for the automatic apportioning of oxygen blown into molten iron. They were also successful in mastering the production of instruments based on radioactive isotopes.

Enterprises of the L'vov economic region have mastered the production of several types of electronic automatic recording and regulating instruments which can be used with various transmitters for automating the industrial processes of many branches of the national economy.

The Odessa Heavy Scales Building Plant imeni Starostin (Odesskiy zavod tyazhelogo vesostroyeniya imeni Starostina) has contributed greatly to technical progress in heavy industry. It produces automatic electronic tensometric scales which weigh railroad rolling stock in travel. The first successes of the enterprises making electronic microscopes and electronic instruments should also be mentioned.

The instrument-making and automation equipment industry of the Ukrainian SSR should raise its output during the Seven-Year Plan to 2.7 times the present output. New plants are under construction or are being planned. Existing plants are being expanded considerably.

A sharp upswing in the production of computing machinery is contemplated, including computers for the continuous control and economic analysis of an enterprise's or a shop's operations and computers for regulating continuous and intermittent processes. Various types of intermittent regulators are being developed, including programing and recording regulators. High-class instruments are being developed for thermal power engineering, electrical engineering, and other measurements.

Miniature electronic, indicating, signaling, and regulating compensators (potentiometers) with contactless rheochords and with multichannel magnetic tape recording will be developed. A series of special regulators for automatic regulation or processes of open-hearth and blast furnaces are also to be developed. -- V. Vitkovskiy, Chief Specialist for Instrument Making and Automation Equipment of Gosplan Ukrainian SSR (Kiev, Rabochaya Gazeta, 24 Jun 59)

D. Georgian SSR

New enterprises of the Georgian SSR are going into operation one after the other. The precision instrument plant in the city of Gori has turned out its first products. An electric machine amplifier plant has been put into operation in Poti.

Several electrical engineering plants have gone into operation in Tbilisi. The Elektrosvarka Plant is making mobile welding converters and automatic and semiautomatic welding equipment. The Elektrodvigatel' Plant is organizing the production of various sizes of electric motors for tower cranes. (Kiev, Pravda Ukrainy, 24 Jun 59)

IV. ELECTRONIC EQUIPMENT

A. General

The number of radio receivers produced in the Soviet republics from 1940 to 1958 is given below (in thousands):

	1940	1950	1953	1956	1957	1958
RSFSR (incl television sets, car radios)	144.5	864.8	1,307	3,592.6	3,358.6	3,891.8
Belorussian SSR (incl television sets)	0.4	46.3	31.4	124.4	127.1	139.1
Azerbaydzhan SSR (incl television sets)	--	6.4	15.4	26.3	28.1	32.7
Latvian SSR	--	138.1	247.4	339.9	485.2	499.8
Estonian SSR	--	20	26.3	9.7	12.2	15.2

(Moscow, Vestnik Statistiki, Jun 59, pp 82-96)

B. Radios

The Estoniya-2 radio-phonograph made by the Tallin Punane RET Plant is a modernized version of the Estoniya. The new set features five short-wave bands, long- and medium-wave bands, and an ultrashort-wave FM band.

The set's frequency limits for AM broadcasting are 60-5,000 cycles; for FM, 60-10,000 cycles; and for record playing, 75-7,000 cycles. It utilizes a type EPU-III two-speed record player.

The Estoniya is supplied from a 110-, 127-, or 220-volt AC circuit, and consumes no more than 120 watts for radio playing and 140 watts for record playing. The set measures 600 x 435 x 360 mm; its extension speakers measure 184 x 154 x 115 mm; and it weighs 25 kg. It retails for 2,300 rubles. (Moscow, Novyye Tovary, No 4, 1959, p 3)

The production of radio-phonographs at the Sarapul Radio Plant imeni Ordzhonikidze is erratic. In addition, the plant's Ural-57 radio-phonograph is so outmoded that it should rightfully be called the Ural-52. The plant attempted to produce the new Kometa radio-phonograph in 1958, but could not find a market for it, since other plants had begun the production of more reliable sets of the same class long before.

Trifonov is chief engineer of the plant; Kalinin is deputy chief designer. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 29 May 59)

The 11-tube Druzhba radio-phonograph has long- and medium-wave bands, three short-wave bands, and one ultrashort-wave band. This set is equipped with a universal record player and retails for 2,300 rubles. (Moscow, Byulleton' Roznichnykh Tsen, No 18, Jun 59, p 35)

Enterprises of the Lithuanian Sovnarkhoz have produced the first models of a combination radio-tape recorder, which consists of a seven-tube receiver with four speakers, and a tape recorder panel in the place occupied by a record turntable on conventional radio-phonographs. Sound can be recorded with a microphone or directly from the radio receiver.

Series production of the new combination sets will begin in August 1959. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 31 May 59)

The Kazan'-2 portable combination radio-phonograph-tape recorder is designed for radio reception in long- and medium-wave bands, for playing both standard and long-play records, and for double-track recording or playback on a magnetic tape recording attachment from a microphone or directly from the set's own or another radio receiver. Besides this, the Kazan'-2 may be used to record onto Type-2 type directly from the pickup arm of the phonograph, whereupon control is effected by means of an optical recording level indicator (6YelP tube) and a type 1-GD-9 speaker. Input power for recording is 65 watts.

The amplifier of the tape recording attachment is combined with the audio-frequency amplifier of the radio-phonograph, a plug-type connector (raz'yem) being used to connect the magnetic heads with the amplifier. The amplifier works on a single-channel circuit (i.e., it is used alternately for recording and playback) and has an erasing head and a universal [recording and playback] head. The recording track is changed by exchanging and turning over the reels. At fast-forward or rewind speeds, the tape is wound directly from one reel onto the other, bypassing the heads and passing through a rotating carrier roller. During this process, an additional [braking] load is put on the unwinding reel.

The reeling mechanism permits uninterrupted recording of music for 2 x 20 minutes (at 78-rpm record speed and 19.2-cm/sec tape speed) or of speech for 2 x 45 minutes (at 33-rpm record speed) and recording onto tape from a phonograph record up to 25 cm in diameter. When recording from a record, the reeling mechanism is supported on special mounts in the carrying case cover. The Kazan'-2 weighs 11.2 kg and is mounted in a carrying case which measures 380 x 300 x 160 mm. The tentative price is 750 rubles.

(Source contains illustration showing reeling mechanism mounted on phonograph turntable.) (Moscow, Novyye Tovary, No 5, 1959, p 3)

C. Television

A complex brigade was formed by the Leningradskiy Sovnarkhoz for developing an industrial model of the newly designed Komsomolets television set. The Komsomolets will replace older types of television sets for mass use. It screen is of the same size as that of the Start or Rekord sets. (Moscow, Sovetskaya Rossiya, 27 May 59)

[Comment: Complex brigade in this case means a group of qualified engineers, technicians, and specialists from a number of branches of industry, who were given an assignment to work on a project of greater than average priority.]

The designers of the new Komsomolets television set had in mind a completely automated plant of the future when they were designing this set. Such a plant is no longer a dream, but a real engineering task; however, as yet this task has not been solved.

In the assembly shop of any television plant there are moving conveyers; however, most of the work is done by hand. Many radio engineering enterprises which produce very complicated apparatus embodying the latest scientific achievements often utilize antiquated processes. During the atomic age, electronic instruments are assembled much in the same way that walls were built, stone by stone, in days of yore.

The situation may be explained partly by the exceptionally rapid development of radioelectronics, which led to duplication of effort and outpaced the development and use of new production methods. The present situation in the radioelectronic industry can be likened to the state of construction several years ago, when each architect strived, not always successfully, to plan his own new building. Radioelectronics today, like construction yesterday, needs its "large prefabricated unit" method. Such a method, the functional unit method, already exists. It is very well known but hardly ever used. When new equipment is designed, no attention is paid to standardizing subassemblies and assemblies, although the State Committee for Electronics has called attention to the necessity for large-scale use of the functional unit method in designing equipment. However, this committee itself has never taken effective measures to carry out its own proposal.

Very little is done with regard to standardizing parts. Parts standardization and utilization of the functional unit method are the first and most important steps in automation of the radio engineering industry.

In designing the new functional-unit television set, its designers encountered the question of organizing the automated production of television sets, but they ran into great difficulties. Dreams of circuit-printing machines, component-installation automatics, automatic checking devices, and other "thinking" machines had to be set aside. No equipment for automating

this production is being produced; moreover, it is being planned for at an extremely slow and inadequate rate. Each plant independently develops its own nonstandard equipment, which is very expensive and often does not approach the modern level of technology.

Consequently, the second most important task is the development of standard industrial processes of assembling and aligning units on standard accessories designed for maximum utilization of industrial automation equipment. Undoubtedly this problem can be successfully solved by Leningrad specialists.

Specialization and centralization have become the watchwords of every speech, every plan. The Leningradskiy Sovnarkhoz is doing much in this regard. The Leningrad Plant imeni Kozitskiy is engaged in centralized production of line transformers and deflection systems for television sets for the entire country. Specialized production of wound products has begun; centralized production of a number of new components is being organized. However, this is not enough, because new problems come up day after day.

What is needed, and is also possible, is a new system of industrial management, an extremely flexible maneuverable system which would make possible the most efficient distribution of production orders in line with a plant's production structure, engineering traditions, and specialization.

If the Komosomolets television set were to be made by old methods, only 140,000-160,000 sets could be produced in existing production space. If, however, one plant would produce functional units, another transformers, and a third plastic housings, and if a fourth would assemble and align the sets, up to 250,000-260,000 television sets per year could be produced.

Specialized production creates the most favorable conditions for the maximum automation of industrial processes. The automation of the electronics industry is closely linked to a number of other problems, such as the practical use of a single universal method of planning; subassembly and parts standardization; development of standard industrial processes and accessories; and, finally, production centralization and specialization. Only the over-all solution of all these problems will render it possible to effectively organize automated production of electronic equipment and to replace old radio equipment production methods with new. -- Engineers K. Runov and B. Aliyevskiy (Leningradskaya Pravda, 3 Jun 59)

The first USSR television unit designed for the remote observation of instruments recording the operation of high-pressure boilers has been put into operation in the dispatcher's room of Leningrad Hydroelectric Power Station No 2. A special radio installation makes it possible for the duty engineer to communicate with the machinery operators.

The television unit, which utilizes an ordinary Avangard television receiver, was designed by the Chair of Television of the Electrical Engineering Institute imeni Bonch-Bruyevich jointly with the Laboratory of Automatics and Measurements of Hydroelectric Power Station No 2. The unit went into experimental operation recently. (Leningradskaya Pravda, 12 Jun 59)

The Leningrad Scientific Research Institute of Television, in collaboration with doctors, has developed a color television unit for the remote observation of surgical operations. The equipment's high sensitivity makes it possible to see every detail of an operation on the television screen. (Kiev, Rabochaya Gazeta, 24 Jun 59)

The Topaz projection-type television set, which has been developed at the Moscow Television Equipment Plant, is designed for serving large audiences. It has 12 channels and can receive ultrashort-wave FM broadcasts; it may also be used for playing records or tapes. Its screen measures 90 x 120 cm (1.08 sq m). It has a 6LK1B picture tube with a service life of 500 hours. Its sensitivity is at least 100 microvolts, which makes it capable of receiving television broadcasts up to 100 km away.

The set's resolution capacity according to the vertical taper line in the center is at least 500 lines. It has 28 tubes and 17 semiconductor diodes, and features automatic gain control, a supplementary selector, an inertial-type automatic line frequency tuner, and a sharpness regulator. The Topaz is more reliable and less costly to produce than the Moskva projection-type television set. It uses 275 watts, weighs 53 kg, and measures 920 x 490 x 450 mm. Its projection screen measures 1,045 x 1,345 mm, weighs 17 kg, and is located 2.5 meters away from the set. The tentative price of the Topaz is 7,000 rubles. (Moscow, Novyye Tovary, No 4, 1959, p 2)

A number of plants have begun the production of experimental consignments of color television sets. These sets will utilize specially designed tubes, many semiconductors, and special picture tubes. They will have screens with diagonal lengths of 53 cm and will receive both color and black-and-white broadcasts. (Moscow, Tekhnika Kino i Televideniya, Jun 59, p 96)

The Leningrad Plant imeni Kozitskiy has produced its first consignment of color television sets. Five of them have been sent to the Exposition of the Achievements of the USSR National Economy. (Leningradskaya Pravda, 23 Jun 59)

In 1959, the L'vov Television Plant will produce 40,000 television sets. Its production will be more than quadrupled by the end of the Seven-Year Plan. It is making preparations for the production of the Trembita television set. (Moscow, Izvestiya, 13 Jun 59)

The Mayak television receiver is a 12-channel, 12-tube table model produced by the Aleksandrov Radio Plant. It has a type 35LK2B picture tube with a 285- x 215-mm image. Provision has been made for connecting a phonograph pickup or an ultrashort-wave FM attachment to the audio-frequencey stage, and also for attaching a tape recorder either for recording or playback. The picture tube, a 1-GD-9 speaker, and an overvoltage indicator are attached to the front panel of the set. The set is based on five printed circuit plates. Sensitivity of the Mayak receiver is 250 microvolts. Image definition at the center of the screen is about 500 lines. Input power is 120 watts for the television receiver and 40 watts for phonograph operation.

Even during power fluctuations from 90 to 150 volts and from 180 to 250 volts, normal operation of the set is ensured by a [manually operated] voltage regulator on the primary winding of the power transformer, with a control lever on the rear panel and an indicator light. This is the first time such a regulator has been used in a television set. This novel installation improves reception and tube life, and consequently results in improved and more dependable performance of the entire unit.

The Mayak measures 485 x 365 x 495 mm and weights 22 kg. It is tentatively priced at 1,800 rubles.

Mass production of the Mayak television receiver will start in 1960. (Moscow, Novyye Tovary, No 6, 1959, p 7)

The 18-tube Khar'kov table-model combination television-radio-phonograph consists of a 12-channel television receiver; a long-, medium-, short-, and ultrashort-wave radio receiver; and a standard and long-play phonograph.

The television receiver has a Type 43LK3B picture tube with a 270- x 360-mm rectangular screen, the horizontal resolving power of which is at least 500 lines and the vertical at least 550 lines.

A four-watt wide-band 4-GD-9 speaker ensures high-quality sound with an undistorted output power of 2 watts. The input power is no more than 150 watts for the television receiver and no more than 45 watts for the radio receiver.

An original circuit design has permitted the use of the same tubes for amplifying both the intermediate-frequency signals in the audio of the television receiver and the intermediate-frequency signals in all wave bands of the radio receiver; and the same audio-frequency amplifier is used in both the television and the radio receivers.

The Khar'kov has a keyboard for switching wave bands and for selecting television, radio, or phonograph operation. The other control knobs are located at either end of the keyboard.

The sensitivity of the television receiver is at least 100 microvolts; that of the radio receiver in the long-, medium-, and short-wave bands is at least 150 microvolts, and in the ultrashort-wave band, at least 30 microvolts. An external dipole antenna is provided for ultrashort-wave reception.

The Khar'kov may be powered from any AC circuit of 110, 127, or 220 volts.

The small size (515 x 490 x 514 mm) and light weight (42 kg) of the Khar'kov were made possible by extensive use of crystal diodes. Its tentative price is 3,000 rubles. (Moscow, Novyye Tovary, No 5, 1959, p 2)

The Belarus'-5 television set receives 12 television channels and receives broadcasts in long-, medium-, and ultrashort-wave bands and three short-wave bands. It utilizes a universal record player and a remote-control unit for the television receiver. The screen size is 360 x 270 mm. The set costs 3,000 rubles in a polished wood cabinet and 3,100 in a varnished cabinet. (Moscow, Byulleten' Roznichnykh Tsen, No 18, Jun 59, p 35)

The Minsk Radio Plant has just begun the production of the Belarus'-5 television-radio-phonograph, which is based on the latest achievements of radio engineering. Its diagonal screen size is 43 cm; the picture size is 360 x 270 mm. Plant designers, headed by V. N. Pumpyanskiy, have put much work into the development of the new set, and this is why it is better than any of its predecessors made at the Minsk plant. It received first prize from the Council of Experts of the All-Union Chamber of Commerce.

According to M. Ya. Kutsev, plant chief technologist, new manufacturing methods had to be developed in order to produce the new set. (Minsk, Sovetskaya Belorussiya, 7 Jun 59)

D. Other Sound Equipment

An experimental model of the type KZM-8 single-track magnetic sound recording apparatus has been produced by the Leningrad Kinap Plant. This apparatus is designed for film studio use and can record on both 35- and 17.5-mm tape. (Leningradskaya Pravda, 3 Jul 59)

The Riga Electrical Machinery Plant [Rizhskiy elektromekhanicheskiy zavod] was founded in 1893 and was formerly the property of a Russo-German stock company.

A. Gumnitskiy is plant director.

The plant is getting ready for the production of three-speed record players for radio-phonographs. During the Seven-Year Plan, it will double its capacity with the outlay of only about 4 million rubles for reconstruction. At present, 170,000 record players per year come off its conveyers. In 1960, it will be producing 400,000 record players per year.

A semiautomatic for zinc-coating parts is ready to go into full operation. All it needs is five electric motors, which the Yerevan Generator Plant (Yerevanskiy zavod "Generator") was to have sent almost a month ago. (Riga, Sovetskaya Latviya, 24 Jun 59)

[Comment: This is the first mention of a Yerevan Generator Plant noted in the Soviet press.]

During the Seven-Year Plan, the Riga Electrical Machinery Plant (Elektromekhanicheskiy zavod) is to supply phonograph pickup units to the Riga VEF Plant and the Riga Radio Plant imeni Popov for installation in their radio-phonographs. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 10 Jun 59)

One of the plants of the Moscow City Sovnarkhoz has begun series production of the type EM-2 portable electric megaphone, which can transmit sound up to 200-300 meters.

(Source gives additional information on the megaphone.) (Moscow, Tekhnika Kino i Televideniya, Jun 59, p 36)

E. Tubes and Bulbs

A very large unit for creating vacuums in television picture tubes has been put into operation at the Moscow Electric Bulb Plant (2). (Moscow, Vechernyaya Moskva, 26 May 59)

(2) Photo showing a tube made on the new unit available in source, p 1, top, left

The Moscow Electric Bulb Plant is producing type DRL high-pressure mercury lamps with corrected light colors of 250, 500, 750, and 1,000 watts. (Moscow, Moskovskaya Pravda, 30 May 59)

According to Ye. Plakhotskiy, chief technologist of the Moscow Electric Bulb Plant, at least 30 constant-flow mechanized lines will go into operation at the plant during the Seven-Year Plan. In 1959, the plant will finish the complete mechanization of the manufacture of fluorescent lamps. In 1960, the production of television picture tubes will be completely mechanized.

A new semiautomatic line for the production of radio tubes (3) is being installed and set up in a bay of the sixth section of shop No 11. (Moscow, Moskovskaya Pravda, 18 Jun 59)

(3) Photo available in source, p 2, bottom right

At the Riga Electric Bulb Plant, 98 percent of all operations in the manufacture of electric bulbs have been mechanized and automated. The plant is now modernizing individual automatic lines.

A new constant-flow line for the assembly of bulbs has been modernized and put into operation in the assembly shop (4). This line will have a productivity of 12,000 articles per shift, instead of the former 9,000 articles per shift. (Riga, Sovetskaya Latviya, 23 May 59)

(4) Photo available in source, p 2, bottom, left

The special design bureau of the Riga Electric Bulb Plant has developed new types of light bulbs designed for lighting machine tools and work positions in industrial enterprises. The bulbs are bell-shaped and are covered on the inside with a special diffusing coating having a high reflection coefficient. Only the bottom of the bulb is transparent and admits a directional beam of light. As a result, the illumination of a certain section is intensified to triple the value of ordinary bulbs.

The new bulbs are rated for 36 volts. This meets the safety standards in many branches of industry.

The plant has already begun series production of the new bulbs. (Moscow, Vechernyaya Moskva, 19 Jun 59)

In 1951, the Riga Electric Bulb Plant produced somewhat more than 3 million builbs. In 1956, it produced 38 million, and in 1958, 56 million bulbs. In 1951, the plant took only 2,000 electric bulbs off each assembly line per shift. In 1956, it took 5,300 bulbs off each line per shift. Now it can get 8,000-11,000 bulbs per shift off each line.

By the end of the Seven-Year Plan, the plant should be producing 100 million electric bulbs per year. This is no small task, and it can be solved mainly by mechanization and automation. The plant is striving to become completely automated in the future. -- Ya. Zakis, Chief Engineer, Riga Electric Bulb Plant (Riga, Sovetskaya Latviya, 24 Jun 59)

New lamps for lighting working positions in industrial enterprises have been developed by the Riga Electric Bulb Plant. The plant will begin series-producing them in 1959. A lamp for lighting classrooms is under development at the plant. A 50-sq-m classroom can be well lit by five or six of the new bulbs, which are 300 w in power and utilize a 220-volt supply.

Another new bulb is designed for lighting streets and industrial buildings.

A. I. Chushkin is chief of the plant's Special Design Bureau. (Riga, Sovetskaya Latviya, 25 Jun 59)

Designers of the Riga Electric Bulb Plant, headed by Engr F. Ozolinya, have developed a series of new two-spiral filament light bulbs, which have a 10-15-percent higher light intensity with a consumption of 3 percent less power than ordinary incandescent bulbs. The plant is now getting ready to put the new economical bulbs into mass production.

In 1960, the plant will produce 10 million of the new light bulbs. (Riga, Sovetskaya Latviya, 3 Jul 59)

The production of grids for radio tubes is one of the most labor-consuming operations in tube manufacture. Consequently, engineers of the Administration of General Machine Building, Leningradskiy Sovnarkhoz, have designed an automatic line for producing radio tube grids. The line consists of special unit-type machinery, including the ZR-70, which is being made by the Leningrad Machine Tool and Automatics Plant.

The ZR-70 is a fascinating unit, unlike any other machine in the world. Its productivity is 30-40 percent higher than that of currently used grid-winding automatics. The plant will finish the ZR-70 before the June Plenum of the Central Committee CPSU. The machine and the entire grid-making line are to be installed at the Leningrad Svetlana Plant.

The Leningrad Svetlana Plant is subordinate to the Administration of the Radio Engineering Industry of the Leningradskiy Sovnarkhoz. Manvelev is deputy chief of the administration. (Leningradskaya Pravda, 23 May 59)

The largest USSR-made television picture tubes have been produced in the laboratory of the design bureau of the L'vov Electric Bulb Plant. The aluminized tube screen measures 560 x 710 mm. The tube's deflection angle is 110 degrees.

Work has begun on the development of a television receiver in which the new picture tube will fit. (Moscow, Tekhnika Kino i Televideniya, Jun 59, p 96)

At first, the L'vov Electric Bulb Plant produced rounded television picture tubes measuring 40 cm in diagonal length. Then it began mass production of rectangular tubes with a diagonal of 43 cm. It has already developed a 53-cm picture tube and is now working on a 76-cm tube. -- F. Kudlay, Director, L'vov Electric Bulb Plant (Moscow, Izvestiya, 14 Jun 59)

Recently, an automatic line (5) with a capacity of 2,000 miniature light bulbs per hour was put into operation at the Ufa Electric Bulb Plant. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 29 May 59)

(5) Photo showing part of the new line available in source, p 3, top

The Tomsk Electric Bulb Plant produces signal lamps. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 24 May 59)

F. Communications Equipment

A plant [unidentified] which specializes in the production of equipment similar to radio-relay line equipment uses only 50-60 percent of its capacity to work on orders for the above-mentioned equipment. Undoubtedly, the heads of the radio engineering industry in Gosplan USSR and Gosplan RSFSR and also the Ministry of Communications USSR could show greater interest in the development of radio relay communications. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 20 May 59)

A group of designers of the Moscow Scientific Research Institute of the Ministry of Communications USSR has developed new radio relay apparatus (6). This apparatus will make it possible to carry on 600 telephone conversations simultaneously or to transmit television programs for long distances. Intermediate stations utilizing this apparatus can forego any operating personnel. The first sets of this apparatus have been tested successfully.

The series production of the new apparatus, called the R-600, will make it possible to solve a number of tasks of the Seven-Year Plan with regard to improved intercity communications and long-distance transmission of television programs. (Moscow, Komsomol'skaya Pravda, 27 May 59)

(6) Photo showing the checking of a high-frequency stand of the R-600 apparatus available in source, p 1, top

Associates of the Chair of Telegraphy of the Electrical Engineering Institute of Communications imeni M. A. Bonch-Bruyevich have successfully transmitted pictures by means of a new electrical photographic method with the use of ordinary paper. This method entails the use of the FT-38 Soviet-made phototelegraphic unit. A thin film of selenium is applied on a metal plate. The lighted image of a photograph or document is projected onto this plate. This method will be used for making typographical plates, for reproducing large numbers of documents, and for photography.

The semiconductor plates are produced on a vacuum unit. (Leningradskaya Pravda, 26 May 59)

An increasing number of constant-flow conveyer lines are being put into operation in the shops of the Leningrad Krasnaya Zarya Plant. Three such lines went into operation during the first quarter of 1959; three more will go into operation shortly in the telephone step-by-step line finders and relays sections.

The plant is finishing preparations for the production of new products, especially an experimental crossbar telephone station for city use. This station is more complicated to manufacture but simpler to operate than existing types.

A constant-flow conveyer line for assembling and adjusting vibrators (7) is in operation in Shop No 4 of the plant. (Leningradskaya Pravda, 27 May 59)

(7) Photo available in source, p 2, top

V. COMPUTERS

Ukrainian designers of the "Promenergoavtomatika" [Industrial Power Engineering and Automatics?] Trust, in collaboration with the Central Scientific Research Institute of Automatics, have developed the first USSR installation for automatic control of the operations of boiler-turbine units. This installation utilizes an electronic computer and requires only one operator.

The installation consists of a special "information system" of units for regulating and checking the operating schedule of power equipment; performing mechanisms; and other equipment. It automatically starts, operates, and shuts off the boiler-turbine unit. It switches operations to other units in case of breakdowns. It continuously controls the operation of the power equipment and periodically records technical data.

The new installation is being installed in preparation for experimental operation at the Khar'kov State Thermal Electric Power Station No 2 in 1959. (Kiev, Pravda Ukrainy, 2 Jun 59)

A computer for making complex mathematical calculations connected with the computation of various optical systems has been developed in the Leningrad Institute of Precision Mechanics and Optics.

The new machine is operated from a switchboard by one person. It is universal, and applicable for purposes other than the computation of optical systems. (Ashkhabad, Turkmenskaya Iskra, 5 Jun 59)

An original computer for making complex mathematical calculations connected with the computation of various optical systems has been developed in the Institute of Precision Mechanics and Optics under the leadership of docent F. Galkin. This machine can add or subtract in .0008 second and find square roots in .08 second. (Leningradskaya Pravda, 7 Jun 59)

R. I. Stakhovskiy, A. A. Fel'dbaum, and L. N. Fintser, scientific associates of the Institute of Automatics and Telemechanics of the Academy of Sciences USSR, have developed original computing devices, called "automatic optimizers." They are used to find the optimum conditions for industrial processes in metallurgy, chemistry, machine building, and other branches of the national economy. For example, the lowest expenditure of fuel with maintenance of the right temperature could be a criterion for the operation of an open-hearth furnace. This criterion can be met by using the new divices to supply the correct amount of air and fuel to the furnace.

First the device makes test changes in the operating conditions of a unit. Then it analyzes and selects the best conditions. It operates in the same way as an experimenter, but at a much higher rate of speed. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 10 Jun 59)

The PRVS-2 unit (8) for rapid and accurate calculation of mine ventilation networks has been developed in the Makeyevka Scientific Research Institute for Safety in Operations of the Mining Industry.' (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 10 Jun 59)

(8) Photo showing the PRVS-2 unit being tested in the Laboratory of Electrical Simulation available in source, p 3, top, left

Several control computers are being developed in the Computing Center of the Academy of Sciences Ukrainian SSR, including machines for controlling Bessemer steelmaking processes. This work is being done jointly with the Dneprodzerzhinsk Evening Metallurgical Institute and the Dneprodzerzhinsk Metallurgical Plant imeni Dzerzhinskiy.

Narrow specialization of control machines impedes their series production. The Computing Center of the Academy of Sciences Ukrainian SSR is developing a standard series of electronic computers, which will eliminate this impediment.

The universal mathematical machines in the Computing Center are used for making calculations for various scientific and design institutions of the Ukraine, and are used in work directly concerned with the development of new control computers.

A program has been prepared by the Computing Center for the Rostov Institute of Railway Transport Engineers, and optimum schedules for the movement of trains have been figured out. These figures are needed for checking the correctness of the methodology of compiling such schedules.

The center is compiling computing programs for certain sections in the production of soda and for the layout of large steel sheets at shipbuilding plants. It is working with the Institute of Automatics of Gosplan Ukrainian SSR to find a way to design computing machines for automating the operations of soaking pits in rolling mills and for other operations in the metallurgical industry.

The Computing Center possesses great capabilities for the development of control computers, but to reap the fruit of these capabilities, it needs to augment its experimental-design facilities.

Experience indicates that the rapid introduction of computer machinery into industry is being impeded by insufficient standardization of the components and assemblies of machines. For this reason, the development of each new machine requires the efforts of large scientific staffs. If the problem of standardization were solved and the production of standard components and subassemblies were organized, even plant laboratories and design bureaus could develop and design mathematical and control computers.

To make components and assemblies of control machines, reliable electronic devices and components are urgently needed, especially crystal triodes and diodes, ferrite matrixes and rings, delay lines, miniature resistors and capacitors, and other devices and components. The demand for these components is so great that often industry is unable to satisfy it. This in turn brings out the problem of organizing series production of basic components for digital machines in the Ukrainian SSR.

The insufficient quantity and often the poor quality of input-output equipment significantly lower the effectiveness of existing machines and impede their use for over-all automation of production processes. It is necessary to develop a single system of transmitters, conversion equipment, preforming mechanisms, and magnetic tape external storage units and to begin series production of such equipment.

Insufficient study has been given to the processes in the chemical, metallurgical, and other branches of industry that are the most difficult to control. Scientific research institutes of various branches of industry still fail to study these processes sufficiently and thus they are unable to compile operation programs for control computers and cannot use them for the most important branches of industry, where their use would have significant effects.

To solve all of these problems, it is necessary to expand the number of organizations engaged in the development and application of computers. Besides augmenting a material facilities of scientific research institutes, it is necessary to organize the series production of assemblies and components of machines and of the machines themselves in a number of sovnarkhozes of the Ukrainian SSR which are best prepared for this work.
-- B. Malinovskiy, Candidate of Technical Sciences, Deputy Director of the Computing Center of the Academy of Sciences USSR (Kiev, Pravda Ukrainy, 21 Jun 59)

The MARS (Mashina avtomaticheskogo regulirovaniya i signalizatsii, machine for automatic regulation and signaling) is a control computer developed by the Special Design and Technological Bureau for Brophysiological Equipment (Spetsial'noye konstruktorsko-tekhnologicheskoye byuro biofiziologicheskoy apparatury). This high-speed electronic machine has already been installed at the Moscow Krasnyy Bogatyr' Rubber Products Plant, where it regulates the industrial processes on 48 presses simultaneously. The MARS can also regulate unit-type machinery and can control 200 temperature-measurement points per minute.

The MARS holds forth great prospects for application in the automation of many processes in the chemical industry. The saving at the [Moscow] Krasnyy Bogatyr' Plant, where four MARS machines will be installed, will amount to more than 2 million rubles per year; only about 1.2 million rubles will be spent for automation purposes.

Series production of the MARS computers will begin in 1959. (Moscow, Moskovskaya Pravda, 24 Jun 59)

An electronic diagnostical machine has been built in the Laboratory of Electrical Simulation of the Academy of Sciences USSR, Moscow.

The experimental model of this machine is supposed to be able to diagnose 96 ailments. Al symptoms of these ailments are numbered on a control panel. By pressing the buttons, a doctor can allow the machine to determine the most typical symptoms of ailments and to make a final diagnosis.

The new machine is one of the exhibits in the pavilion of the Academy of Sciences USSR at the Exposition of the Achievements of the USSR National Economy. (Moscow, Moskovskaya Pravda, 25 Jun 59)

A new electronic logical recording unit has been designed at the Scientific Research Institute of Computer Machine Building. This machine is designed for the automatic control of production processes.

Usually, industrial processes at modern petrochemical plants and thermal electric power stations are controlled by hundreds of measuring and recording instruments. Control panels are dozens of meters in length. While an operator records instrument readings, the readings are already losing their values.

The new electronic logical recording unit developed by the division headed by B. V. Ushakov, Doctor of Technical Sciences, solves the problem of centralized control.

According to P. N. Kopay-Gora, chief of the Laboratory of the Electrical Simulation Division, the machine can automatically take and record 50 measurements in 3 minutes.

The printer unit of the machine prints readings in black if they are normal and red it they are abnormal. Readings are printed with the exact time alongside them. Laboratory tests of the machine have been successful. -- Engr Ye. Radzivilov (Moscow, Moskovskaya Pravda, 26 Jun 59)

The Institute of Automatics and Telemechanics of the Academy of Sciences USSR has developed an electronic computer for use in the complete automation of pipe-welding operations. The welding machine operator need only begin the initial part of the welding process, and then the computer continues to check the seam quality. This welding system was tried out on one of the electric pipe-welding mills of the Moscow Pipe Plant. At present, it is in an experimental operating state. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 28 Jun 59)

VI. PRECISION EQUIPMENT

A. Automation

New industrial processes, particularly in such fields as the atomic industry, chemistry, and metallurgy, can be accomplished only with highly automated and mechanized units. It is only through automatic control that artificial earth satellites and cosmic rockets can be launched into predetermined trajectories with high accuracy.

The USSR has been very successful in automating a number of branches of industry, namely, power engineering, petroleum refining, and metallurgy.

At present, the level of USSR science the technology is such that it is fully capable of organizing large-scale automation in all branches of the national economy and of reorganizing industrial processes on the basis of full automation. This can be done because the condition of the theory of automatic control and control devices makes it possible to convert to the automatic control of production processes utilizing the most advantageous process schedules based on feedback systems. Many scientific research and experimental design organizations have developed and tested mock-up models of new technical ideas in the field of automation equipment.

A large-scale conversion toward uninterrupted constant flow methods of production is under way in industry. Thus, the USSR has accumulated sufficient scientific and technical know-how in the field of automation.

However, on the whole, automation in the USSR lags behind the needs of the national economy and behind the level of automation in certain capitalist countries, particularly the US. So far, we are still automating mainly individual sections of the production process and not all operations of the process, and this does not produce such a favorable effect. Such labor-consuming processes as loading and unloading operations, finishing operations, and transportation are not only nonautomated, but are not even mechanized in many cases. Thus, in many branches of industry, many more workers are occupied in auxiliary operations than are engaged in basic production work. This is the case, for example, in the production of superphosphates, in bread baking plants, and in the processing of seeds and food products. The insufficient level of mechanization of finishing sections of rolling mills and the unsuitability of existing mechanisms for automation hinder automation of these sections, although up to 70 percent of all rolling mill workers are engaged in finishing operations.

The following are the main reasons for the lag in automation work of USSR industry:

Automation is being applied without sufficient study of industrial processes and is often tailored to existing processes which are unsuitable for automation.

In planning automated in-stations, proper calculations are not made of the effectiveness that is expected.

Planning and application of new automation systems are complicated by the insufficient number and capacity of instrument making enterprises engaged in the production of automation equipment, the uncoordinated products-lists of these enterprises, the failure to produce several kinds of automation equipment, and the obsolescence of a large portion of the instruments produced. The shortage of automation equipment hamstrings the initiative of an enterprise which, if there were equipment available, would actively promote automation.

The poor organization of automation activities forces an extension of deadlines for planning, installing, and utilizing automated installations and leads to a lack of coordination in the development of new industrial processes and in the planning of new automated enterprises. Consequently, capacities and capabilities which we possess are not used sufficiently. The development of new installations is often duplicated by several organizations, while many problems remain unsolved by anyone.

There is a shortage of qualified personnel for scientific research work, for designing instruments, and for planning, installing, and operating automated installations. The training of specialists in the field of automation is going along so slowly now, that the gap between need for and availability of specialists is not closing but is widening as time goes by.

The number and capacity of scientific research organizations are by far incapable of meeting the tasks in this field. Insufficient experimental facilities in institutes, special design bureaus, and plants cause delays in the completion of scientific research work and, what is most important, in the application of the results of this work. For this reason, many new technical ideas arising in the USSR, which are very important to the national economy, are applied in practice in foreign countries sooner than in the USSR.

To eliminate these deficiencies, it is necessary to expand the production of automation and mechanization equipment. The development of the branch of industry engaged in this production should be at such a rate as not to hold back the development of other branches of industry. An increased output of automation and mechanization equipment can and will be effected through better employment of existing production capacities, by better organization, cooperations, and standardization, and by proper products-list distribution, which could bring about a doubled or tripled output. Increased output will also be fostered through the construction of new enterprises.

The instrument-making industry should be guided toward the development of a single state system of automation equipment, which would include various types of equipment necessary for solving contemporary complex problems of automating production. This system should be established according to the composite unit system. A comparatively small products-list in such a case could make possible the mass production of better automation equipment at a lower price. Automation equipment could be put together in various kinds of "packages" for application in many fields.

The system of planning, "packaging," and assembling automated installations should be revamped, and the proper organizations should concentrate their efforts on solving the automation problems that are most important to the state and on establishing priorities for this work in accordance with economic importance. In addition, automation work should be organized in such a way that technologists and designers can participate in it as effectively as automation specialists.

It is also necessary to accelerate the organization of experimental model automated installations, shops, and enterprises in the main branches of industry. Such installations should be developed with the utilization of the most highly skilled scientists, engineers, automation specialists, technologists, and designers. These installations should be given priority in being provided with instruments, equipment, cable products, etc.

Scientific research and design organizations developing new principles of building systems of automatic control, new automation equipment, and new automation systems must be expanded at an accelerated rate. (Moscow, Avtomatika i Telemekhanika, Jun 59, pp I-III)

M. Rakovskiy is deputy chairman of the Scientific and Technical Council for Over-All Mechanization and Automation of Gosplan USSR. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 24 Jun 59)

According to Ye. P. Stefani, director of the Scientific Research Institute of Over-All Automation, Glavniiproyekt [Main Administration of Scientific Research and Planning Institutes] of Gosplan USSR pays no attention to institutes and design bureaus engaged in the field of automation. (Moscow, Vechernyaya Moskva, 13 Jun 59)

B. Institutes

The Kirovakan NIIAvtomatika [Scientific Research Institute for the Automation of Production Processes in the Chemical Industry and Nonferrous Metallurgy] is collaborating with the Kirovakan Chemical Combine in automating the combine's dilute nitric acid shop.

A number of automatic instruments developed by the NIIAvtomatika are on exhibition in Moscow. A multipoint pneumatic-electric recorder and a regulator of the level of liquid under the packing gland of a centrifugal pump were developed by the Laboratory of Pneumatic-Hydraulic Regulators under the leadership of Engr E. Arzumanov.

A piezometric density meter for various liquids was developed by M. Korostelev, chief of the Experimental Setup Division.

The Laboratory of Electrical and Electronic Regulators, headed by Engr G. Isabekyan, has developed a flow refractometer for determining the coefficient of breakup or concentration of two-component liquids in flux. The type BMR-2 contactless magnetic regulator for automatically regulating the supply of ore to ball mills of ore concentration factories has been developed by P. Yerokhin, a worker of the Laboratory of Telemechanics.

NIIAvtomatika is participating in research work toward the over-all automation of the future Akhta Mineral Chemical Combine. The institute's divisions of chemical industry and nonferrous metallurgy are getting ready to develop a system for automating certain continuous processes. A brigade of specialists has been organized to conduct experimental work in the experimental clay shop of the Kanaker Aluminum Plant.

An agreement for creative cooperation has been concluded between NIIAvotomatika and the Chair of Thermal Control and Automatics of the Moscow Order of Lenin Power Engineering Institute. Both parties to the agreement have begun developing theoretical bases, standard solutions, and engineering calculation methods for systems of automatic control of heat-exchange processes of the chemical industry.

Recently, a group from the Moscow Scientific Research Institute of Organic Intermediate Products and Dyes arrived in Kirovakan and signed an agreement with NIIAvtomatika. The two parties will cooperate in automating the production of phenol, nitrobenzol, and aniline at chemical enterprises.

By the decision of its scientific and technical council, the institute has begun studying the problem of developing automatic control systems based on mathematical machines, for the chemical industry. Shop No 1-8 of the Yerevan Plant imeni Kirov is being used as an experimental base. Institute and plant workers are working together on this project.

In accordance with the Seven-Year Plan, large-scale work in the over-all automation of production processes has been started at the enterprises of the Mining and Metallurgical Combine imeni Zavenyagin (gornometallurgicheskiy kombinat imeni Zavenyagina). NIIAvtomatika is participating in this work and has been assigned the development of a set of pneumatic and hydraulic performing mechanisms. The institute is to supply the blueprints of prototype models by the end of 1959.

The institute has begun the development of over-all automation systems for the production of acetic acid, butyraldehyde, butyric acid, and vinyl acetate and for the rectification of methanol at the Yerevan Polivinilatsetat Plant. A group of institute workers assigned to the plant are cooperating with plant workers in studying production processes and industrial performing systems. They will then make blueprints for the automation of the processes.

Workers of a number of divisions and laboratories are working on an order from the Ufa Chemical Plant for the automation of the basic units for producing chlorobenzene. The institute is using know-how derived from the automation of similar processes at the Yerevan Plant imeni Kirov.

Recently the institute made an agreement with a nitrogen fertilizer plant for the joint development of systems for the experimental automation of a conversion unit in the plant's dilute nitric acid shop. The institute is cooperating with the Alaverdi Cooper-Chemical Combine and the Kirovakan Chemical Combine in solving a number of scientific and technical problems.

Glavniiproyekt [Main Administration of Scientific Research and Planning Institutes] of Gosplan USSR has reviewed the institute's structure, and has resolved to expand it. The experimental base is being expanded and new divisions and laboratories are being created. Among these are a technical division with a bureau of scientific and technical information, two experimental laboratories, and experimental production facilities for the Experimental Setup Division. The volume of research work will be expanded. In 1960, 50 percent more funds will be spent for research work than in 1959. (Yerevan, Kommunist, 25 Jun 59)

The Gori Scientific Research Institute for the Automation of Production Processes Industry has developed an instrument for detecting freon gas leakages in refrigeration installations. This instrument was recently approved by the Georgian Sovnarkhoz.

In general, the Gori institute is engaged in basic problems of overall mechanization of production processes in the light and food industries. At present, a group of scientific associates of the institute are installing an automatic constant-flow line for rolling and sorting tea leaves at the Dranda Tea Factory. This line, which utilizes a continuously operating roller of the A. Kakalashvili system, will be the first continuously operating line at a Soviet tea factory.

Institute associates are implementing a method for dyeing cloth at the Tbilisi Silk-Weaving Mill.

The institute is also developing a refractometer, which will be used at Champagne factories for determining sugar content in wine. It is installing a constant-flow line for processing green tea at the Lanchkhuti Tea Factory. (Tbilisi, Zarya Vostoka, 24 May 59)

NIKIMP (Scientific Research and Design Institute for Testing Machines, Instruments, and Equipment for Measuring Mass) of the State Committee for Automation and Machine Building of the Council of Ministers USSR is located at Kholodil'nyy Pereulok 1, Moscow. (Moscow, Vechernyaya Moskva, 29 Jun 59)

[Comment: Only recently, this institute was subordinate to the Moscow City Sovnarkhoz.]

C. Electronic and Electrical Instruments

The Scientific Research Institute of Electrography of the Lithuanian Sovnarkhoz and the Institute of Physics of the Earth of the Academy of Sciences USSR have developed a new oscillograph; it records readings on a paper tape covered with an inexpensive semiconductor, which develops itself as the process is going on.

It is expected that the series production of this kind of oscillograph will begin in 1960 in the Lithuanian SSR and the Moldavian SSR. (Moscow, Izvestiya, 16 Jun 59)

The Kishinev Electrical Measuring Instrument Plant has begun production of the type N700 (POB-14M) 14-channel oscillograph, which was developed in the Institute of Physics of the Earth imeni O. Yu. Shmidt of the Academy of Sciences USSR and in the VNIIEP [All-Union Scientific Research Institute of Electrical Instrument Making].

This oscillograph is a universal recording instrument, which records high-frequency processes, utilizing galvanometers for measuring purposes.

(Source gives additional information on the N700 oscillograph.) (Moscow, Priborostroyeniye, May 59, p 30)

The Kishinev Electrical Measuring Instrument Plant is a modern enterprise which has begun production of a 14-channel oscillograph that records on photosensitive paper. (Moscow, Moskovskaya Pravda, 22 May 59)

The Tallin Punane RET Plant, located on ulitsa Anvel'ta 9/11, Tallin, is the producer of the MOM-4 portable teraohmmeter, which has a measuring range from 10 kilo-ohms to 100 teraohms in ten measurement scales. It uses not more than 30 watts of power, measures 330 x 220 x 215 sq mm, and weighs 8 kg.

The plant is also the producer of the MVL-3 millivoltmeter, which is designed for measuring sinusoidal voltages in a wide frequency range and can be used for measuring circuits of radio receivers, amplifiers, and other equipment. Its measuring range is from one to 1,000 millivolts on 10-, 30-, 100-, 300-, and 1,000-millivolt scales.

The MVL-3 uses about 80 watts, measures 310 x 215 x 195 sq mm, and weight 9 kg.

(Source contains detailed information on these instruments.) (Moscow, Pribory i Tekhnika Eksperimenta, No 2, Mar-Apr 59, pp 159-160)

Formerly, the Yerevan Elektrotochpribor Plant, which makes M-24 microammeters, had to procure the magnetic cores for these meters from the Krasnodar Instrument Making Plant. Since it had difficulties getting regular shipments of the cores from Krasnodar, Onika Nersesyan, plant chief technologist, looked for a different way to get cores. Finally, plant innovators devised a new automatic machine for producing cores. Two such machines can produce 6,000 cores per shift, or 100,000 per month. Consequently, the Yerevan plant no longer has to depend on the Krasnodar Plant. (Yerevan, Kommunist, 24 Jun 59)

The Sumy Electronic Microscope and Electroautomatics Plant, the newest plant in Sumy, has finished making experimental models of mass spectrometers. These instruments are based on the latest achievements in electronics. They can be used for analyzing metals, and for control systems in conjunction with mathematical computers. (Kiev, Pravda Ukrainy, 22 May 59)

The Mytishchi Electric Meter Plant has begun production of miniature household electric meters, which are more accurate and about one third smaller than the formerly produced types.

Fourteen constant-flow lines and conveyer installations are in operation at the plant. (Moscow, Leninskoye Znamya, 3 Jun 59)

The Mytishchi Electric Meter Plant enjoys close relations with its neighboring plant, the [Pushkino] Termoelektrogenerator Plant. The Mytishchi plant has a main conveyer for the assembly of electric meters (9). Zaytsev is plant chief engineer. (Moscow, Leninskoye Znamya, 12 Jun 59)

(9) Photo available in source, p 1, top

D. Remote Control Apparatus

In June, the Leningrad Elektropul't Plant will send several hundred control panels to the Kaunasskaya GES (Hydroelectric Power Station), the Stalingrad Krasnyy Oktyabr' Metallurgical Plant, and the heat and electric power station of one of the chemical combines in Siberia.

At present the plant is making a telemetering device for measuring gas pressure on order for the builders of the Stavropol'-Moscow gas pipeline. This is the first time such equipment will be used on gas trunklines in the USSR. The first consignment of these telemetering devices will be sent in June. (Leningradskaya Pravda, 17 Jun 59)

The Leningrad Elektropul't Plant is finishing the assembly of control panels (10) for the Stalinogorsk Chemical Combine and for other enterprises. (Moscow, Ogonek, No 27, 28 Jun 59, p 1)

(10) Photo available in source, p 1, bottom, left

The Moscow Energopribor Plant produces thousands of instruments which regulate industrial processes in many USSR enterprises. They are used at electric power stations for guarding against overloads and for ensuring uninterrupted operations. Instruments made by this plant maintain predetermined temperature and pressure and fulfill many other duties at other enterprises. -- I. Filimonov, Director, Moscow Energopribor Plant (Moscow, Vechernyaya Moskva, 19 Jun 59)

The Rostov Rostovenergo Electrical Repair Plant is developing improved telemechanical equipment, with which many power systems are equipped. (Rostov-na-Donu, Don, Apr 59, p 107)

E. Conventional Process Control Equipment

In the near future, large-scale chemical production based on oil shale deposits will begin in the Estonian SSR. Estonian scientists and instrument makers are developing modern control and automation equipment for this purpose. On 23 June 1959, development of a new instrument, the universal gas chromatograph, was completed. This instrument will be used for the analysis of organic substances for controlling production and for automating industrial processes.

Workers of the Tallin Measuring Instrument Plant (Tallinskiy zavod izmeritel'nykh priborov), under the leadership of Candidate of Technical Sciences Endel' Lippmaa of the Tallin Polytechnic Institute, designed and produced the new chromatograph.

The universal gas chromatograph differs from similar USSR and foreign instruments in its great flexibility in operation and its broad applicability in connection with various types of chemical production, for analyzing not only gases, but also low boiling substances. The instrument is designed for operation in a relatively high temperature region, up to 230 degrees centigrade.

The instrument has three columns for separating complex chemical compounds. The only other instrument capable of operating as efficiently is a much more complicated and expensive American instrument.

The analysis can be made with mixtures of any compounds similar in structure utilizing only several milligrams of the substance for analysis.

By the end of 1959, it is expected that the plant will produce industrial models of gas chromatographs. During the Seven-Year Plan, it will specialize in the production of such instruments. (Tallin, Sovetskaya Estoniya, 26 Jun 59)

The Khar'kov Control and Measuring Instrument Plant is getting ready to produce its first consignment of the DMI diaphragm differential manometer, which is used for the automatic regulation of fuel of open-hearth and blast furnaces, coking ovens, gas thermal electric power stations, and other installations. Only 2.5 kg of nonferrous metal was used to make the new instrument, as compared with the 37 kg formerly needed.

The plant is also getting ready for series production of a DMKK instrument, which will regulate pressure, pressure head, air intake, and fuel consumption. (Kiev, Pravda Ukrainy, 31 May 59)

A conveyer for the assembly of electronic potentiometers (11) is in operation at the Leningrad Lenteplopribor Plant. Ye. I. Ionikh is deputy chief technologist of the plant. (Leningradskaya Pravda, 31 May 59)

(11) Photo available in source, p 2, top, right

The Moscow Manometr Plant has developed a miniature semiconductor secondary signaling instrument and has prepared it for series production. The new instrument will be used to automate processes in the chemical and other industries. (Moscow, Moskovskaya Pravda, 24 Jun 59)

Products of the Tartu Instrument Making Plant are shipped from the plant's railroad platform in baggage cars of passenger trains. These small precision instruments do not require freight cars for shipment. Instruments are shipped to Leningrad, Riga, Gor'kiy, and Khar'kov. Instruments with the plant trademark TA are also sent to China, India, Korea, Mongolia, Czechoslovakia, Albania, and Bulgaria.

The plant makes taxi meters and oil gauges for motor vehicles. It also makes the KR-4, TRK-55, TRDK-55, and TRV-2 automatic thermal power engineering instruments and thermal relays. Thermorelays made at the plant are used in seagoing ships. The plant recently developed the KR-4 combination relay, which regulates temperature and pressure simultaneously. (Tallin, Sovetskaya Estoniya, 24 Jun 59)

The new-type TS-018 indicator, which was developed by the "Termopribor" Design Bureau as a unit with the type DTR-018 thermistor-type transmitter, is designed for signaling excessive temperatures measured at one to five points.

The operating principle of this indicator is based on a relay effect taking place when the transmitter temperature reaches the preset level. Should the preset level be exceeded, this fact is signaled on a type ST-1 single-point indicator, which is designed for operation with a resistance thermometer.

(Source gives further information and illustrations.) Moscow, Priborostroyeniye, May 59, pp 29-30)

F. Process Control Instruments Based on Radioactive Isotopes

Early in 1959, the Tallin Control and Measuring Instrument Plant finished assembling the first USSR-made universal instrument for measuring the thickness of coatings or plating, which operates on the basis of radioactive isotopes.

The instrument was designed by plant workers in collaboration with the All-Union Scientific Research Institute of the Printing and Publishing Industry. (Moscow, Komsomol'skaya Pravda, 31 May 59)

In 1959, the Tallin Experimental Control and Measuring Instrument Plant (Tallinskiy Opytnyy Zavod Kontrol'no-Izmeritel'nykh Priborov) will begin production of 12 types of instruments using radioactive isotopes and designed for the automation of various processes. The plant has produced its first consignment of automatic positioning level gauges for petroleum products, which are being made for oil refineries. It has also shipped automatic control apparatus to an automatic crushed rock plant in Tsarekonstantinovka, Ukrainian SSR.

Instruments made by the Tallin plant utilize radiation for automatic control and regulation of production processes in the metallurgical, chemical, slate, food, and other industries. The plant has begun the production of contactless instruments for measuring weight and thickness, for counting articles, and for marking steel.

Its instruments are distinguished by their universality, low cost, and high sensitivity. Because their radioactive sources are of a very low activity, they are fully safe for workers and do not harm materials or food products. Because individual elements have been standardized, series-production of the instruments is cheap. Likewise, it is possible to interchange parts during operation and to use standard subassemblies for developing new instruments.

A year ago, plant workers had pledged to quintuple their production of automation equipment. This pledge is close to realization now. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 12 Jun 59)

The Tallin Experimental Control and Measuring Instrument Plant is the producer of instruments for determining the weight of paper, fabrics, or oilcloth without weighing the materials directly, and of contactless measuring instruments for determining liquid level in hermetically sealed vessels.

The plant personnel became interested in producing instruments utilizing radioactivity after they found out that Latvian scientists had designed such instruments.

"We concluded a contract of cooperation with the laboratory of radioactive methods of control and automatics of the Institute of Physics, Academy of Sciences Latvian SSR," said Karl Shpor, plant chief engineer.

The plant collaborated with the scientists in producing experimental models of portable radioactive liquid level indicators. Then it developed standard electronic subassemblies of automatic radioactive instruments and transmitters. An experimental consignment of these instruments was installed in enterprises of the Latvian, Moscow, and Leningradskiy sovnarkhozes. A commission formed by the Latvian Sovnarkhoz gave a high appraisal to the instruments made in Tallin. The Latvian enterprise where the radioactive instruments were installed saved more than 20 million rubles in one year.

The Tallin-made instruments were also given a high appraisal at the Second All-Union Conference for the Peaceful Use of Atomic Energy, where plant representatives demonstrated and lectured about their products.

It was difficult to master the production of such complex instruments. The plant was aided greatly by the Institute of Physics of the Academy of Sciences Latvian SSR in training its personnel.

At present, the radioactive instruments made by the Tallin Experimental Control and Measuring Instrument Plant are used widely. They are used for automating the checking of welded seams of hot spans and for controlling multiple drawing mills for drawing steel wire at metallurgical enterprises; for the automatic control of liquid and friable substances; for regulating various physical parameters, such as temperature, pressure, and strain; and for other purposes.

The plant is getting ready to produce new instruments. It is developing an instrument for determining the thickness of electro-plating. During the Seven-Year Plan, it will become even more specialized in the production of instruments using radioactive isotopes.

Recently it was given an assignment to produce a very complicated instrument for the automatic control of the level of loading of a furnace. Plant engineers and workers of the Institute of Ferrous Metallurgy have begun development of such an instrument. (Tallin, Sovetskaya Estoniya, 23 Jun 59)

The Tallin Experimental Control and Measuring Instrument Plant has organized series production of apparatus using radioactive isotopes. These apparatus are designed for automatically checking and regulating the level of fluids and friable materials, calculating and checking the quality of products, and measuring the density and thickness of products.

According to the Estonian SSR newspaper Rakhva Khyayal', "During the first year of the Seven-Year Plan, this plant will effect a fivefold increase in the production of automation equipment utilizing radioactive isotopes."

The plant has resolved to take charge of the introduction of automation equipment which it has produced into 50 technological sections of enterprises of the Estonian SSR. The first such apparatus has been installed at such enterprises as the Maardu Chemical Combine, the "Myanniku" Construction Materials Plant, the "Kokhtla-Yarve" Shale-Chemical Combine, the Tallin Fish Combine, and the Tallin Liquor-Vodka Plant.

The use of apparatus based on radioactive isotopes at all mines of the Estonslanets Trust is expected to save more than 7 million rubles per year. (Moscow, Pravda, 24 Jun 59)

The new Kaluga Pyrometric Instrument Plant has shipped instruments with the inscription "Kalugapribor" to Leningrad, Vladivostok, Murmansk, Odessa, Noril'sk, and Ulan-Ude. Its instruments have also become well known in China, Burma, India, and Austria. Wherever labor-consuming processes are being automated, its instruments are needed.

The plant produces the KEP-12U electropneumatic remote-control instrument, which is used for automating operations at many chemical enterprises. It also produces portable optical pyrometer units, which are used for automating complex processes in the metallurgical industry. It makes the UR-4 and UR-6A radioactive level gauges, which are used at chemical and food industry enterprises for the accurate measurement of the levels of boiling or bubbling substances.

The PZhR-2 radioactive density meter made by the plant measures the density of liquids. The RIU-1 radioactive indicator for determining the level of the separation point of substances of unlike densities has been given a favorable appraisal by petroleum refinery workers.

The experimental shop is developing new products for series production and test stands and nonstandard equipment. Soon the vacuum tube industry will receive the MIR-3 instrument for checking industrial processes. The FOTOPIR high-speed photoelectric pyrometer will soon appear on rolling mills; it will indicate temperatures from 600 to 1,400 degrees. Another instrument, the RAPIR radiation pyrometer, will be used in the metallurgical industry for the contactless measurement of the surfaces of bodies heated to 100-4,000 degrees centigrade.

V. Smirov is chief engineer of the plant; M. Bulanov is deputy chief technologist. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 14 Jun 59)

The new Kalugapribor Plant has gone into operation on the northern outskirts of the city of Kaluga. It has begun series production of a number of instruments needed for over-all automation and mechanization of industrial processes. It will soon produce new pyrometric instruments. (Moscow, Leninskoye Znamya, 5 Jun 59)

G. Petroleum and Gas Instruments

The Leningrad Lenneftekip Plant produces many kinds of instruments, including a 500-gram air pressure reduction unit and a 150,000-kg liquid level gauge, which are used for automatic control of certain processes at chemical, gas, and petroleum enterprises. There is hardly a chemical or petroleum enterprise in the USSR that does not use instruments made by the Leningrad plant, which produces up to 120 types. The instruments are also in great demand in the people's Democracies.

In 1959, the plant began series production of automatic gas pressure regulators and has shipped the first consignment to the consumer. Soon it will organize the production of scale-type liquid level gauges for measuring liquids in closed vessels. These instruments can operate with pressures up to 40 atmospheres and temperatures from minus 40 to plus 200 degrees centigrade. Experimental models of these instruments are now in operation at two petroleum refineries.

At present, the plant's experimental shop has begun making experimental instruments for determining the specific gravity of liquids passing through pipelines. This is the first time the plant has made such instruments. (Leningradskaya Pravda, 23 May 59)

The Mytishchi Instrument Making Plant has begun series production of modernized mobile core-sampling stations and pulling devices for the petroleum industry. One new type of series-produced equipment is the AEKS-900 automatic mobile electronic core-sampling station. (Moscow, Leninskoye Znamya, 21 May 59)

The Mytishchi Instrument Making Plant, in collaboration with the All-Union Institute of Telemechanics and Radio Engineering (Vsesoyuznyy institut telemekhaniki i radiotekhniki) and the All-Union Scientific Research Institute of Geophysics, is designing new machines for locating ore deposits. The VP-59, designed for locating petroleum deposits, ore beds, and scattered ore deposits, is already being assembled and finished. (Alma-Ata, Kazakhstanskaya Pravda, 22 May 59)

H. Medical and Physical Instruments

The Moscow Electrical Medical Equipment Plant has developed and is assembling the new VEKS-3 vector electrocardioscope, which is used for studying human heart activity. It is better than earlier equipment of this type in that it has a larger screen and can be used for simultaneous recording of three electrocardiograms and vectorcardiograms. (Moscow, Moskovskaya Pravda, 27 Jun 59)

Associates of the Scientific Research Institute of Resort Planning (Kurortologiya) of the Georgian SSR have developed a special instrument, the DU-2 dosimeter, which is designed for measuring the ultraviolet radiation of the sun's rays and artificial light sources. This instrument can be used at resorts, in climatological studies, and for quartz irradiation. It was demonstrated at the All-Union Conference on Ultraviolet Radiation in Leningrad, where it received highly favorable appraisal.

The new instrument has undergone testing and an experimental repair workshop of the Ministry of Health USSR has begun its production. (Tbilisi, Zarya Vostoka, 7 Jun 59)

The Tbilisi Design Bureau for Instruments and Automation Equipment has developed the PPP-38 instrument, designed to determine soil acidity and alkalinity. It is a portable instrument meant for field use. It was developed by a group headed by S. Saakyan. (Stalinabad, Kommunist Tadzhikistana, 11 Jun 59)

VII. ELECTRICAL PRODUCTS

A. Wire and Cable

The Kishinev Mikroprovod Plant is the first plant in the USSR to master the industrial production of microwire resistors. The wires used are a fraction of the size of human hair. (Moscow, Moskovskaya Pravda, 22 May 59)

Six years ago, specialists of the Sverdlovsk Uralkabel' Plant designed and produced an automatic constant-flow line for the production of rubber for insulation purposes and for flexible cable. Two such lines are now in operation at the Uralkabel' Plant; however, such equipment is not going introduced at a satisfactory rate at other cable plants and in the rubber industry.

Planning organizations, when designing automatic constant-flow lines, make them unnecessarily complicated. They use intricate electrical circuits requiring much electrical equipment, clumsy untested mechanisms such as automatic remote-controlled scales, and pneumatic transport devices for "smelted" (plavlennyy) chalk [produced by a dry method] and chemically precipitated chalk. For this reason, many plans have not been realized.

Recently, other impediments to the introduction of new machinery were discussed at a conference of workers of cable enterprises. One and the same organization compiles and issues essentially different technical and technological recommendations for different plants. The plans for automatic constant-flow lines for the [Berdyansk] Azovkabel' Plant, the [Tomsk] Tomkabel' Plant, the Tashkentkabel' Plant, and the Uralkabel' plant were entirely different from one another, although they were all designed for supplying rubber compound according to a standard formula.

The Uralkabel' Plant's experience indicates that simple and proven mechanisms, units, and equipment should be planned for automatic constant-flow lines.

The implementation of automatic constant-flow lines is delayed also because of the erroneous opinions of leading personnel of certain planning institutes, such as Rezinoproyekt [State Institute for Design and Planning of Rubber Products Enterprises], that new units are suitable only where small numbers of rubber mixture formulas are applied.

We believe that all enterprises of the tire and rubber industries should be equipped with automatic constant-flow lines for making rubber. -- I. Kuranov, Director, Uralkabel' Plant; S. Mendlin, Chief Engineer; and I. Shepelev, Acting Chief Designer (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 27 May 59)

The Zestafoni Cable Plant has begun production of two kinds of cable and has already produced its first hundreds of meters of cable. In 1959, it will begin production of five kinds of cable and will produce 3 million rubles' worth of products (12).

D. Kvantrishvili is chief mechanic of the plant. (Tbilisi, Zarya Vostoka, 3 Jun 59)

(12) Photo showing the first meters of cable being checked at the plant available in source, p 3, top, left

Much is being done at the Podol'sk Cable Plant to improve production processes. Since the beginning of 1959, more than 100 winding and braiding machines have been installed there, and new insulation materials are being used.

The plant has a new machine (13) on which wire is wound with fiberglass. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 14 Jun 59)

(13) Photo available in source, p 3, bottom

The Podol'sk Mikroprovod Plant has an enameling shop No 2 (14). (Moscow, Leninskoye Znamya, 23 Jun 59)

(14) Photo available in source, p 1, top

V. Talumyae is chief engineer of the Tallin Eestikabel' Plant. (Moscow, Pravda, 3 Jul 59)

B. Switches and Relays

In recent years, low-voltage equipment manufacture has experienced a considerable upswing; nevertheless, the quality and quantity of the equipment do not satisfy the growing needs of the national economy.

The Ufa Low-Voltage Electrical Equipment Plant, a leader in its field, can serve as an example of why the industry is lagging.

The plant is not clearly specialized. It makes knife-switches for 100-1,000 amp, protective devices for 15-1,000 amp, variable and permanent cam remote-control units for 2-24 circuits, distribution boxes for 15-400 amp, universal cricuit breakers for 2-16 sections, fuse elements, and other equipment, making a total of more than 650 type-sizes.

Planning organs fail to take stock of the plant's capabilities when issuing assignments. For instance, the Division of Electrical Engineering Industry of Gosplan RSFSR is planning for the production of PR-2 fuses at the plant, although it does not have the machine tools and attachments to produce them. At the same time, the Kashin Electrical Installation Products Plant, which has an automated line for the production of series PR-2 fuses, has not been assigned their production.

In our opinion, the production of protective units can be distributed among the following plants: PR-2, 15-16 amp -- Kashin Electrical Installation Products Plant; PR-2, 100-amp -- Tashkent Electrical Engineering Plant; and PR-2, over 100 amp -- Ufa Low-Voltage Electrical Equipment Plant.

The production of knife switches and throwover switches from 100 to 600 amp should be distributed among the Ufa, Kursk, and Gusev plants.

Our electrical equipment plants have very inadequate design divisions, which are occupied mainly with problems connected with series production. Products often have to be sent to the All-Union Electrical Engineering Institute in Moscow or Leningrad for testing.

Equipment at many plants does not meet modern requirements. Half the industrial equipment at the Ufa Low-Voltage Electrical Equipment Plant has been in operation over 15 years. -- A. Yanchitskiy, Deputy Chief Designer, Ufa Low-Voltage Electrical Equipment Plant (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 3 Jun 59)

The Ul'yanovsk Kontaktor Electrical Equipment Plant (Ul'yanovskiy zavod elektroapparatury "Kontaktor") had intended to stop production of intermediate relays for automatic lines and of telpher starters so that a special plant for their production would be constructed in the near future.

However, the plant later decided to keep on manufacturing these products and to more than double their output without the assignment of additional funds. (Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 12 Jun 59)

C. Small Motors

Recently, the first stage of the Leninakan Micropower Electric Motor Plant went into operation and its first consignment of motors was produced. The assembly section, where finished motors are assembled, tested, final-inspected, and packed, has gone into operation. So far the plant has been getting semifinished products from other enterprises. A machine section will soon go into operation. This section will make parts and subassemblies of motors, and hardware. During the fourth quarter of 1959, the plant will produce the first motors made entirely in its own facilities.

In mid-April 1959, a building with about 1,500 sq m of production space was put into operation. By the end of the Seven-Year Plan, several more new buildings will be constructed and the plant will attain its planned capacity.

The plant will be producing a few dozen different kinds of electric motors, which will be used in heat-regulation units, in cybernetics, on automatic constant-flow lines, in instrument making, in the coal industry, and in various other branches of the national economy.

In the near future, the plant will become one of the largest enterprises in Armenia both in gross output and in the relative importance of its products.

The type of micropower electric motor currently produced by the plant has 73 type-designations of parts and subassemblies. It consists of more than 500 parts, which are extremely difficult to make and require high skill.

To attain the planned capacity of the plant, it will be necessary to set up many technological sections and groups and special laboratories. The enterprise must be furnished with all the instruments and gauges it needs; to produce one motor, more than 400 type-designations of instruments and gauges have to be used.

Of the 900,000-ruble allotment to the plant for 1959, more than 600,000 has already been spent. -- M. Sarkisyan, Director, Leninakan Micropower Electric Motor Plant (Yerevan, Kommunist, 19 May 59)

D. Batteries

A conveyer line for molding storage battery plates, which was developed by a branch of the Scientific Research Storage Battery Institute and plant engineers, has been installed at the Podol'sk Storage Battery Plant. This is the first time that the labor-consuming process of battery plate forming has been fully mechanized anywhere in Europe. This line is installed in a new shop (15) and forms a complete production cycle with an automatic line for processing and coating storage battery plates, which is already in operation. The forming line is due to go into operation on 24 June 1959. Whether or not the plant meets this deadline depends on the manner in which it gets its supplies. It is now dickering over 15 tons of vinyl plastic pipe and sheets, which are needed for getting the conveyer into operation. It lacks many instruments and mechanisms. It is hoped that the Administration of the Electrical Engineering Industry and Instrument Making of the Moscow Oblast Sovnarkhoz will take all possible measures to help the plant start the line on time. (Moscow, Leninskoye Znamya, 2 Jun 59)

(15) Photo showing a lengthwise view of a shop available in source, p 2

Using the same number of workers and possessing the same amount of production space as in 1958, PAZ (Podol'sk Storage Battery Plant) will produce double the number of storage batteries in 1963. The PAZ batteries are always needed for motor vehicles and tractors.

M. Kovalenko is plant director. (Moscow, Leninskoye Znamya, 23 Jun 59)

E. Other Products

All labor-consuming processes at the Ust'-Kamenogorsk Capacitor Plant have been mechanized or automated. The plant has a vacuum impregnating shop (16). (Alma-Ata, Kazakhstanskaya Pravda, 27 Jun 59)

(16) Photo available in source, p 3, bottom, second from left

The Tbilisi Electric Welding Equipment Plant has begun the production of the new ADK-500-6 unit for welding round seams under flux. This unit was designed by the All-Union Scientific Research Institute of Electric Welding Equipment. (Tbilisi, Zarya Vostoka, 29 May 59)

[Comment: This is a new plant recently put into operation.]

In 1959, the Samarkand Kinap Plant produced an experimental consignment of 28-SN-1.25 voltage stabilizers, designed especially for use with rural motion-picture equipment.

(Source gives additional information on this voltage stabilizer.) (Moscow, Kinomekhanik, Jun 59, p 31)

The Riga Diesel Plant has produced its first experimental consignment of diesel-electric generators, which do not require the constant presence of operators. They are designed for 8 days of steady independent operation and are equipped with special transmitters and units to protect them from breakdowns. Oil pressure and temperature, water level and temperature, and generator load are controlled automatically.

The plant is getting ready for series production of these automated diesels. They will be widely used on radio-relay communications and television lines, in agriculture, and for other purposes. (Yerevan, Kommunist, 11 Jun 59)

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